

Taxonomic Study of the Genus *Fleutiauxellus* Mequignon (Coleoptera, Elateridae, Negastrinae) in Korea

Jin-Il KIM, Tae-Man HAN¹⁾, and Seung-Hwan LEE¹⁾

Department of Biology, Sungshin University, Seoul, 136-742 Korea

¹⁾National Institute of Agricultural Science and Technology, Suwon, 441-707 Korea

E-mail: jikim@cc.sungshin.ac.kr

Abstract A taxonomic study of the genus *Fleutiauxellus* belonging to the Negastrinae in Korea was carried out. Four species are recognized including two new species, *F. grandiniger* sp. nov. and *F. parvus* sp. nov., one new subspecies, *F. curatus coreaensis* subsp. nov., and one newly recorded species, *F. yotshuboshi* Kishii, 1976. However, *F. quadrillum* (Candèze, 1873) previously recorded in Korea is not convinced in this work. Descriptions, key, and stereomicroscopic and SEM image photos of species are provided.

Key words Coleoptera, Elateridae, Negastrinae, *Fleutiauxellus*, Taxonomy, Korea

INTRODUCTION

The genus *Fleutiauxellus* Mequignon, 1930 consists of approximately 40 species throughout the world and most species were reported in Japanese fauna. Members of this genus are generally found at the water's edge containing sands, pebbles or stones. This genus are often confused with closely related genera due to morphological similarities. Stibick (1971) transferred two genera, *Aplotarsus* Curtis and *Curtisius* Miwa, into this genus. Ôhira (1988) synonymized *Migiwa* Kishii under the *Fleutiauxellus* including subgenus and also treated the genus *Microhypnus* Kishii as a subgenus of the *Fluetiauxellus*. Recently, Kishii (1994) rearranged three subgenera, *Fleutiauxellus*, *Migiwa*, and *Neomigiwa*, under the genus.

In the present study, we follow Ôhira's (1988) system of taxonomy, but don't apply subgeneric level. In Korea, *Migiwa* (= *Fleutiauxellus*) *quadrillum* (Candèze, 1873) was reported by Kim and Park (1991, 1992). But we unfortunately could not find the specimens used in two faunistic reports and the species has not been collected. We described and diagnosed for four species including two new species, one new subspecies, and one newly recorded species from Korea.

In this study were examined 649 specimens. Most of them were collected using an aspirator in water-sides of rivers and streams, or meadow area of forests during 1998 to 1999. Some additional specimens were based on the collection of Sungshin Women's University [SSWU] and National Institute of

Agricultural Science and Technology [NIAST]. The type materials except for the marked NIAST are deposited in SSWU.

The provincial abbreviations used in this paper are as follows: CB (Chungcheongbug-do), CN (Chungcheongnam-do), GB (Gyeongsangbug-do), GG (Gyeonggi-do), GN (Geyongsangnam-do), GW (Gangweon-do), JB (Jeonrabug-do), and JN (Jeonranam-do).

SYSTEMATICS

Genus *Fleutiauxellus* Mequignon, 1930 애방아벌레속 (신칭)

Fleutiauxellus Mequignon, 1930, Bull. Soc. Ent. Fr.: 95. Type-species: *Hypnoidus maritimus* Curtis, 1840, Ann. Mag. nat. Hist. 5: 277.

Aplotarsus Curtis, 1854, Trans. Ent. Soc. Lond. III: 15.

Curtisius Miwa, 1934, Rep. Dep. Agric. Gov. Res. Inst. Formosa 65: 26.

Migiwa Kishii, 1966, Bull. Heian High School (8): 14.

Diagnosis. Body flat, 2~6 mm long in general. Head generally flat; frontal carina developed. Antennae generally exceeding beyond pronotal hind angles; 2nd antennal article shorter than 3rd one or sometime subequal. Pronotum convex moderately; lateral margin arcuate, sinuate at base of hind angle; hind angle short, with one carina; surface weakly or strongly granulate. Prosternum broad; prosternal pleural suture arcuate, double-lined. Claws simple or with feebly basal tooth. Bursa copulatrix with two sclerotic plates.

Distribution. Europe, Asia (Korea, Japan, Siberia), N. America.

Key to species of the genus *Fleutiauxellus* Mequignon in Korea

1. Elytra without marcula 2
- Elytra with four marculae 3
2. 3rd antennal article about 1.4 times longer than 2nd (Fig. 1-A); pronotum covered roughly and distinctly ridgy granules (Fig. 2-A); pronotal hind angle sinuate at base *F. curatus coreaensis* ssp. nov.
- 3rd antennal article about 2.3 times longer than 2nd (Fig. 1-B); pronotum covered smoothly and distinctly ridgy granules (Fig. 2-B); pronotal hind angle not sinuate at base, stout *F. grandiniger* sp. nov.
3. 2nd and 3rd antennal articles subequal (Fig. 1-C); pronotum covered with obscure granules (Fig. 2-C); elytra ovate, not so elongate *F. parvus* sp. nov.
- 3rd antennal article about 1.6 times longer than 2nd (Fig. 1-D); elytra subparallel-sided, elongate 4
4. Surface of pronotum feebly sinuous on dorso-lateral part, minutely granulate *F. quadrillum*
- Surface of pronotum distinctly and strongly granulate (Fig. 2-D) *F. yotsuboshi*

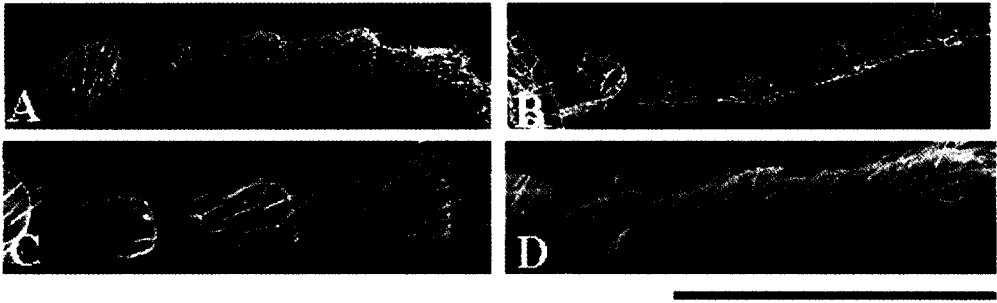


Fig. 1. Antennal articles of the *Fleutiauxellus* spp. (Scale bar: 0. 231 mm). A. *F. curatus coreaensis* subsp. nov.; B. *F. grandiniger* sp. nov.; C. *F. parvus* sp. nov.; D. *F. yotshuboshi* Kishii.

***Fleutiauxellus curatus coreaensis* Kim et Han, ssp. nov.** 검정애방아벌레 (신칭)

(Figs 1-A, 2-A, 3-A, 4-B)

Description. Body (Fig. 3-A) 3.85 mm long and 1.25 mm wide (Paratypes: 3.5~4.5 mm long and 1.2~1.6 mm wide). elliptic, elongate, subparallel-sided. Color black or blackish brown, feebly shining, but one half of 1st and 2nd antennal articles, apex of mandible, legs reddish brown; femur dusky brown. Punctures dense, fine. Vestiture pale brown, dense, short, recumbent.

Head (Fig. 1-A). Flat between eyes; surface rugose; frontal carina developed, truncated at middle, thickly ridged above antennal sockets, bifurcated at base; frontal groove narrowed in middle. Mandibles bidentate. Labrum semicircular, 1.5 times as wide as long. Maxillary palpi hatchet shaped; 4th palpomere subtriangular, 1.6 times as long as wide. Antennae slender, half of 11th article exceeding beyond pronotal hind angle; 1st article ovate, large; 2nd small, subcylindrical; 3rd triangular, feebly serrate, 1.42 times longer than 2nd; 4th to 10th triangular, serrate.

Thorax (Fig. 2-A). Pronotum convex moderately, 1.15 times as wide as long; lateral margin feebly arcuate, sinuate at base of hind angle; disc covered strongly and distinctly ridgy granules, with median longitudinal line without puncture and pubescence; hind angle short, divergent lateral backwardly, slightly bent downwardly, with one carina extending to basal one third along lateral margin. Prosternum convex moderately, broadest in middle; anterior margin weakly rounded; posterior process straight, suddenly narrowed towards apex; punctures rare, fine; prosternal pleural suture double lined, feebly arcuate; propleural punctures deep and rather large. Scutellum tongue shaped, flat, parallel-sided, 1.14 times as wide as long. Metacoxal plate flat, posterior margin feebly carinate, weakly expanded in middle part. Legs slender, simple; claws with strongly expanded tooth at base.

Elytra. Elongate, 1.75 times as long as wide; lateral margin subparallel sided in basal half; humeral mucro feebly projected; striae distinct; intervals weakly convex anteriorly.

Abdomen. 7th sternite subtriangular shaped, 1.82 times as long as wide.

Aedeagus (Fig. 4-B). Median lobe slender, digitate, straight, but broadest part weakly bent in profile, gradually tapered apically, roundly pointed at apex, 1.38 times longer than telomeres. Paramere bifurcate, slightly attenuate towards apex; telomere rounded at apex, with 3 major setae sited on medio-

lateral margins of anterior part.

Female. Very similar to male, but 3rd antennal article serrate, 11th one not reaching to apex of pronotal hind angle and body generally larger than male.

Type materials. Holotype: GB- 1 ♂, Namdaeri, Buseok, Yeongju, Korea, 30 VI 1998 (Kim *et al.*). Paratypes: 1 ♂, 8 ♀, ditto; 5 ♂, 1 ♀, GW- Hongcheon, 25 V 1986 (S.H. Lee) [NIAST]; 5 ♂, 1 ♀, Mt. Balgyo, Cheongil, Hoengseong, 22 VII 1998 (Han et Kang); 4 ♂, 2 ♀, Mt. Myeongseong, Galmal, Cheolwon, 5 VI 1999 (T.M. Han); 1 ♂, ditto, 12 VIII 1999 (T.M. Han); 4 ♂, 1 ♀, Mt. Hambaek, Gohan, Jeongseon, 14 VIII 1999 (T.M. Han); 2 ♂, 1 ♀, Mt. Hoeryeongbong, Bongpyeong, Pyeongchang, 23-24 VII 1998 (T.M. Han); GG- 22 ♂, 6 ♀, River Hantan, Cheongok, Yeoncheon, 22 VI 1998 (Han et Kang); 2 ♂, Mt. Chukryeong, Sudong, Namyangju, 5 VI 1999 (T.M. Han); GB- 4 ♂, 6 ♀, Mt. Baekam, Onjeong, Uljin, 29 V 1999 (T.M. Han); CB- 2 ♀, Mt. Weolak, Jecheon, 20 VI 1984 (S.H. Lee); CN- 1 ♂, 1 ♀, Mt. Mansu, Buyeo, 12 VI 1999 (T.M. Han).

Etymology. The new subspecies was named as *F. curatus coreaensis*, because we has regarded it as a Korean endemic subspecies.

Distribution. Korea.

Remarks. This subspecies is very similar to *F. curatus curatus* (Candèze, 1873) (specimens examined: 5 ♂, 5 ♀, Kamo, Toyogawa, Japan, 14 VII 1990. H. hira) but can be distinguished from *F. c. curatus*

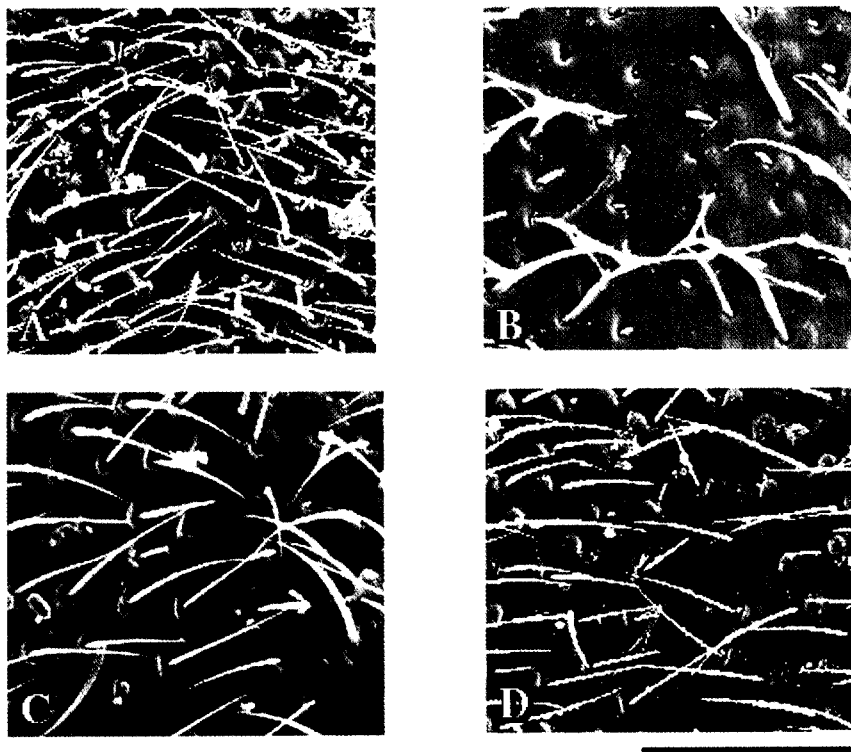


Fig. 2. The granulation of dorso-median part on the pronotum of the *Fleutiauxellus* spp. (Scale bar: 0.1 mm). A. *F. curatus coreaensis* subsp. nov.; B. *F. grandiniger* sp. nov.; C. *F. parvus* sp. nov.; D. *F. yotshuboshi* Kishii.

because the aedeagus is with more elongate median lobe and more sharpened apex of the paramere (Fig. 4-A, B).

***Fleutiauxellus grandiniger* Kim et Han, sp. nov.** 큰검정애방아벌레 (신칭)

(Figs 1-B, 2-B, 3-B, 4-C)

Description. Body (Fig. 3-B) 4.7 mm long and 1.75 mm wide (Paratypes: 4.1~5.3 mm long and 1.4~2.0 mm wide), distinctly elongate, subparallel-sided, Color black, opaque, but basal two antennal articles, femur, apex of mandibles dusky brown or dusky reddish brown; legs reddish brown. Punctures dense, fine. Vestiture pale brown, short, recumbent.

Head (Fig. 1-B). Flat between eyes; surface distinctly rugose, wholly clothed regular granules; frontal carina developed, truncated in middle, thickly ridged above antennal sockets, bifurcate at base; frontal groove rather deep, narrowed in middle anteriorly. Mandibles bidentate. Labrum semicircular, about 2 times as wide as long. Maxillary palpi hatchet shaped; 4th palpomere flat triangular, 1.6 times as long as wide. Antennae elongate, last 2 antennal articles exceeding beyond pronotal hind angle; 1st article swelling, large, anterior margin feebly expanded anteriorly; 2nd subglobular, small, short; 3rd cylindrical, 2.3 times longer than 2nd; 4th to 10th triangular, serrate; 11th narrowly elliptic.

Thorax (Fig. 2-B). Pronotum feebly convex, 1.12 times as wide as long, broadest in middle; lateral margin gently arcuate, not sinuate at base of hind angle; disc covered smoothly and roundly ridgy granules, with median longitudinal line without puncture and pubescence; hind angle short, stout, divergent backwardly, with one carina extending to basal one third along lateral margin. Prosternum convex moderately, broadest in near middle; anterior margin feebly rounded; posterior process straight, suddenly narrowed at apex; prosternal pleural suture double-lined, feebly arcuate; propleural punctures minute, moderately dense. Scutellum tongue shaped, elongate, widest in middle, 1.2 times as long as wide. Metacoxal plate flat, weakly and roundly expanded in middle of posterior margin. Legs slender, simple; claws feebly toothed at base.

Elytra. Elongate, 1.77 times as long as wide; lateral margin parallel-sided in basal half; humeral mucro indistinct; striae distinct; intervals convex anteriorly.

Abdomen. 7th sternite semicircular, 1.94 times as wide as long.

Aedeagus (Fig. 4-C). Median lobe straight, slender, but gently bent in profile, gradually narrowed to apex, 1.25 times longer than telomeres. Paramere bifurcate, feebly attenuate towards apex; telomere slender, rounded at apex, with 3 major setae on middle part of lateral margin; basimere parallel-sided.

Female. Similar to male, but can be distinguished by antennae more short, 11th antennal article only exceeding to pronotal hind angle, and body is generally larger than male.

Type materials. Holotype: CB- 1 ♂, Uipungri, Danyang, Korea, 28 VI 1998 (Kim *et al.*). Paratypes: 5 ♂, 4 ♀, ditto: GB- 6 ♂, Namdaeri, Buseok, Yeongju, 30 VI 1998 (Kim *et al.*); 2 ♀, Mt. Baekam, Onjeong, Uljin, 29 V 1999 (T.M. Han).

Etymology. The new species is named as *F. grandiniger* because the body is more black and larger than other Korean species of this genus.

Distribution. Korea.

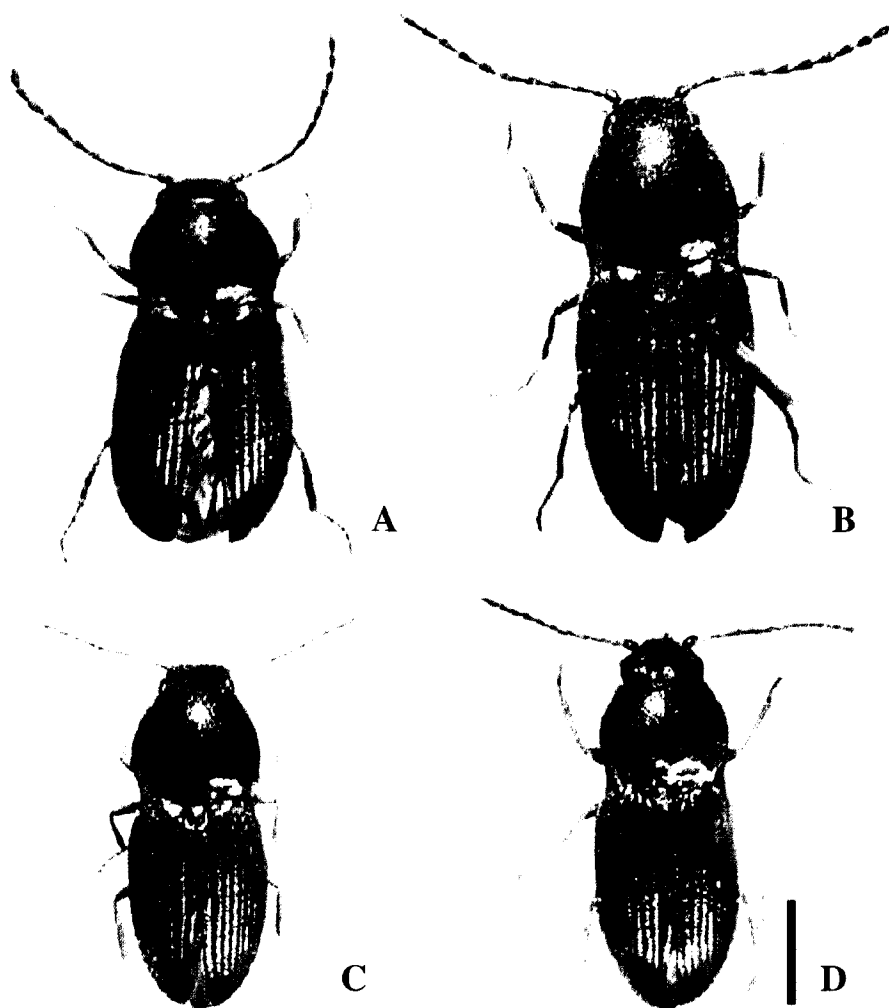


Fig. 3. The adult males of the *Fleutiauxellus* spp. (Scale bar: 1 mm). A. *F. curatus coreaensis* subsp. nov. (holotype); B. *F. grandiniger* sp. nov. (holotype); C. *F. parvus* sp. nov. (holotype); D. *F. yotshuboshi* Kishii.

Remarks. This species resembles *F. curatus* (Cand ze, 1873) and *F. tutus* (Lewis, 1894) (specimens examined: 2 ♂, 2 ♀, Renge spa, S-Echigo, Japan, 29 VII 1997, K. Baba) in Japan, but can be distinguished by larger body size, distinctly shorter 2nd antennal article than 3rd one, more roundly and distinctly ridgy granulation on the pronotum, and not sinuate pronotal hind angle at base, and the thicker and elongate median lobe in the aedeagus.

***Fleutiauxellus parvus* Kim et Han, sp. nov.** 작은턱점애방아벌레 (신칭)

(Figs 1-C, 2-C, 3-C, 4-D)

Description. Body (Fig. 3-C) 2.85 mm long and 1.15 mm wide (Paratypes: 2.4~3.5 mm long and

0.8~1.5 mm wide), elliptic, not so elongate, convex moderately. Color black or blackish brown, shining, but basal three antennal articles, legs, mouth part except for mandibles and labrum pale yellow; rest antennal articles, labrum, mandibles dusky reddish brown; elytral four maculae reddish brown. Punctures more or less rare, rather large. Vestiture short, pale yellow, rather recumbent.

Head (Fig. 1-C) Weakly convex between eyes; surface weakly sinuous; frontal carina developed, feebly expanded anteriorly, rather truncated in middle, thickly ridged above antennal sockets, bifurcated at base; frontal groove narrowed in middle. Mandibles bidentate. Labrum semicircular, 1.6 times as wide as long. Maxillary palpi hatchet shaped; 4th palpomere triangular, 2.0 times as long as wide. Antennae slender, barely reaching to apex of pronotal hind angles; 1st article swelling, large, stout, anterior margin feebly expanded; 2nd article cylindrical, small; 3rd subcylindrical; 1.12 times longer than 2nd (subequal); 4th to 10th triangular, feebly serrate; 11th narrowly elliptic.

Thorax (Fig. 2-C). Pronotum convex, 1.17 times as wide as long, broadest in middle; lateral margin arcuate, sinuate at base of hind angle; disc covered obscure and rounded granules with median longitudinal line without puncture and pubescence; hind angle short, divergent lateral backwardly, with one carina extending to basal one third along lateral margin. Prosternum convex moderately, broadest in near middle; anterior margin rather truncated; posterior process straight, gradually narrowed towards apex; prosternal pleural suture double-lined, feebly arcuate; propleural punctures more or less deep. Scutellum tongue-shaped, parallel-sided, subequal as long as wide. Metacoxal plate flat; posterior margin truncated. Legs slender, simple; claws expanded tooth at base.

Elytra. Not so elongate, subovate, feebly convex in dorso-median part, 1.5 times as long as wide; lateral margin arcuate; humeral mucro weakly projected; striae distinct; intervals moderately convex anteriorly. Four marculae distinguished; anterior a pair of maculae extending from base to 3rd intervals; posterior a pair of marculae ovate, large, but sometimes obsolete.

Abdomen. 7th sternite subtriangular, 1.9 times as wide as long.

Aedeagus (Fig. 4-D). Median lobe digitate, straight, gradually tapered apically, roundly pointed at apex, 1.4 times longer than telomeres. Paramere bifurcate, feebly attenuate towards apex; telomere sharply pointed at apex, with 2 major long setae sited on median lateral margin; basimere subparallel-sided.

Female. Similar to male, but antennae more short, reaching to base of pronotal hind angles, body generally larger than male.

Type materials. Holotype: GW- 1 ♂, Mt. Taebaek, Korea, 13 VIII 1999 (T.M. Han). Paratypes: 9 ♂, 5 ♀, ditto: GW- 2 ♂, 5 ♀, Mt. Balgyo, Cheongil, Hoengseong, 22 VII 1998 (Han et Kang); 1 ♂, ditto, 23 VII 1998 (T.M. Han); 7 ♂, 9 ♀, Mt. Odae, Jinbu, Pyeongchang, 24 VI 1998 (Han et Kang); 11 ♂, 23 ♀, Mt. Hambaek, Gohan, Jeongseon, 14 VIII 1999 (T.M. Han); 5 ♂, 1 ♀, Mt. Myeongseong, Galmal, Cheolwon, 5 VI 1999 (T.M. Han); 1 ♂, 1 ♀, Mt. Hoeryeongbong, Bongpyeong Pyeongchang, 23-24 VII 1998 (Kim *et al.*): GG- 73 ♂, 22 ♀, Ihwangri, Janghowon, Icheon, 23 V 1998 (Han et Kang); 6 ♂, Mt. Chukryeong, Sudong, Namyangju, 10 VIII 1999 (T.M. Han); 2 ♂, 1 ♀, Banweol, 21 V-5 VII 1973 (Y.I. Lee), [NIAS]; 1 ♀, Seongnam, 19 VI 1987 (S.B. Ahn) [NIAS]; 1 ♂, 1 ♀, Suwon, 26 VI 1991 (S.H. Lee), [NIAS]; GB- 42 ♂, 37 ♀, Namdaeri, Buseok, Yeongju, 30 VI 1998. (Kim *et al.*): CB- 3 ♂, 3 ♀, Mt. Weolak, Checheon, 21 VI 1985 (S.H. Lee), [NIAS]; JN- 1 ♂, Valley Baemsagol, Mt. Jiri, 23 VII 1993 (T.M. Han).

Etymology. The specific name, *F. parvus*, was derived from the smaller body than other Korean species of this genus.

Distribution. Korea.

Remarks. This species is similar to *F. quadrillum* (Candèze, 1873) (specimens examined: 1 ♂, 1 ♀, Aomori-ken, Araya, Japan, 7 VII 1972. H. Sato; 3 ♂, 3 ♀, Mennoki T. Aichi ken, Japan, 9 VI 1991. H. Hira) and *F. yotsuboshi* (Kishii, 1976) (specimens examined: 5 ♂, 5 ♀, Ogura, Wakayama-shi, Japan, 12 V 1990. H. Hiramatsu) in Japan. But the species is easily separated from the others because the body is smaller, the 2nd and 3rd antennal articles are subequal in length, the granules on the pronotum are indistinctly and roundly developed, the elytra is ovate shape, and the aedeagus with more slender median lobe and more obtuse apex of paramere.

***Flautiauxellus quadrillum* (Candèze, 1873)**

Cryptohypnus quadrillum Candèze, 1873, Mém. Soc. r. Sci. Liège (2) 5: 11–12.

Migiwa quadrillum: Kishii, 1966: 14.; Kim et Park 1991: 193; 1992: 223.

Distribution. Korea (?), Japan and N–E China.

Remarks. This species was described originally from Japan by Candèze (1873). The species closely resembles *F. yotsuboshi*, but differs in more minute granules on the head and pronotum, and the more stout median lobe of the aedeagus. Since Kim and Park's (1991) record, no more specimens has been collected in Korea. Also, unfortunately, specimens reported by Kim and Park's (1991, 1992) are missing. A future study is necessary to confine the occurrence of the species in Korea.

***Flautiauxellus yotsuboshi* (Kishii, 1976) 녀점애방아벌레 (신칭)**

(Figs 1–D, 2–D, 3–D, 4–E)

Migiwa yotsuboshi Kishii, 1976, Bull. Heian High School (20): 33–34. pl. 5.

Diagnosis. Body (Fig. 3–D) 3.0~4.4 mm long and 1.1~1.7 mm wide, subparallel-sided. Color blackish brown, but basal two antennal articles, apex of mandibles, femur dusky reddish brown. Legs reddish brown. Head (Fig. 1–D) flat between eyes, surface rugose, with minute granules, frontal carina developed. Antennae slender; 11th article reaching to apex of pronotal hind angle; 3rd article 1.4 times longer than 2nd. Pronotum (Fig. 2–D) convex, with median longitudinal line without puncture and pubescence, covered strongly and distinctly ridgy granules on surface. Metacoxal plate truncated at posterior margin. Legs slender, simple; claws feebly expanded at base. Elytra elongate, subparallel-sided, more or less flat above, with four maculae; a pair of anterior maculae extending from base to 4th striae; a pair of posterior maculae ovate, but sometimes obsolete. Aedeagus (Fig. 4–E) trident; median lobe digitate, rather thick, rounded at apex, 1.22 times longer than telomeres; paramere bifurcate, attenuate towards apex, telomere sharply pointed at apex, with 3 major setae sited on anterior lateral margin, basimere feebly arcuate.

Female. Similar to male. But antennae shorter, not reaching to apex of pronotal hind angles, 3rd article not serrate, and body generally larger than male.

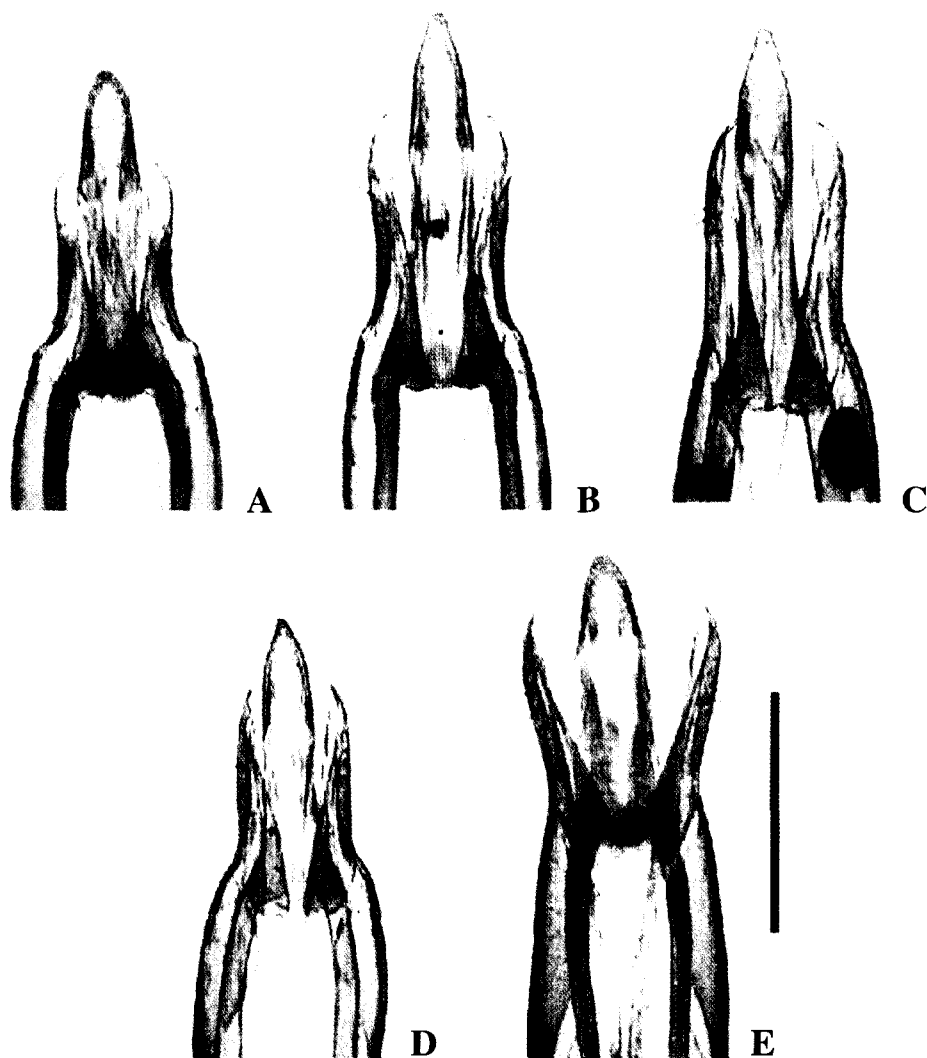


Fig. 4. The median lobe and parameres of the aedeagus of the *Fleutiauxellus* spp. (Scale bar: 0.25 mm). A. *F. curatus curatus* (Canèze) (from Japan); B. *F. curatus coreaensis* subsp. nov.; C. *F. grandiniger* sp. nov.; D. *F. parvus* sp. nov.; E. *F. yotshuboshi* Kishii.

Specimens examined. GW- 6 ♂, 10 ♀, Mt. Balgyo, Cheongil, Hoengseong, 22 VII 1998 (Han et Kang); 13 ♂, 12 ♀, Mt. Myeongseong, Galmal, Cheolwon, 5 VI 1999 (T.M. Han); 2 ♂, 2 ♀, Valley Seokhang, Yeogweol, 13 VIII 1999 (T.M. Han); 1 ♂, Gangreung, 4 VI 1980 (J.I. Kim); 1 ♀, Hongcheon, 25 V 1986 (S.H. Lee), [NIAS]: GG- 4 ♂, 40 ♀, River Hantan Cheongok Yeoncheon, 22 VI 1998 (Han et Kang); 7 ♂, 5 ♀, Sudong, Namyangju, 5 VI 1999 (T.M. Han); 2 ♀, Mt. Cheonggye, Gapyeong, 27 VI 1991 (J.I. Kim); GB- 14 ♂, 11 ♀, Namdaeri, Buseok, Yeongju, 30 VI-1 VII 1998 (Kim *et al.*); 2 ♂, 3 ♀, Valle Bulyong, Uljin, 29 V 1999 (Kim *et al.*); 5 ♂, 7 ♀, Mt. Baekam, 29 V 1999 (T.M. Han); CB- 42 ♂, 25 ♀, Uipungri, Danyang, 28. VI. 1998 (Kim *et al.*); CN- 34 ♂, 35 ♀, Mt. Oseosan,

Cheongra, Cheongyang, 11 VI 1999 (T.M. Han): JN- 1 ♀, River Seomjin, Gurye, 21 V 1999 (T.M. Han).

Distribution. Korea and Japan.

Remarks. This species closely resembles *F. quadrillum*, but differs from the more dense and larger granules covered on surface of the head and pronotum, and the paramere of the aedeagus is more sharpened at apex. The species is newly recorded from Korea.

ACKNOWLEDGEMENTS

The authors thank to Dr. Hitoo Ôhira, National Institute for Physiological Sciences, Myodaiji, Okazaki, Japan, for giving us very precious informations, references, and loan of Japanese specimens. We also wish to express our thanks to Dr. Takashi Kishii, Kamihamuro 1-10 Takatsuki, Osaka, Japan, for tendering many valuable papers.

REFERENCES

- Candèze, E. 1873. Insectes recueillis au Japon par Mr. G. Lewis. Élatérides. *Mém. Soc. r. Sci. Liège*. 5(2): 1-32.
- Kim, J.I. and H.C. Park. 1991. The survey on the entomofauna at the Mt. Myungji under the resting-year scheme; the first year report. *Rep. Surv. Mt. Myungji and Mt. Mugap. Ecosyst. Kyōnggi-do*: 167-208.
- Kim, J.I. and H.C. Park. 1992. A faunistic study of terrestrial insects in Daechung lake. *Rep. Surv. Daechung Lake. Ecosyst.*: 215-236.
- Kishii, T. 1966. Some new forms of Elateridae in Japan. IV. *Bull. Heian High School* (13): 1-11.
- Kishii, T. 1976. New Negastrinae with Some Notes. Some forms of Elateridae in Japan (X). *Bull. Heian High School* 20: 17-46.
- Kishii, T. 1994. Elateridae from Taiwan, with descriptions of some new taxa (8) (Coleoptera). A study of the materials collected by the late Dr. Kintaro Baba in 1986 to 1989. *Mem. Iss. Late Dr. Kintaro Baba. Special Bull. of Essa ent. Soc., Niigata* 2: 179-209.
- Miwa, Y. 1934. The Fauna of Elateridae in the Japanese Empire. *Bull. Agr. Inst. Formosa* : 1-281.
- Ohira, H. 1988. On the generic classification of the subfamily Negastrinae in Japan (Coleoptera, Elateridae). *Trans. Essa. Ent. Soc., Niigata* (66): 3-17.
- Stibick, J.N.L. 1971. The generic classification of the Negastrinae (Coleoptera, Elateridae). *Pacific Ins.* 13(2): 371-390.

한국산 애방아벌레속 (딱정벌레목, 방아벌레과, 애방아벌레아과)의 분류학적 연구

김진일 · 한태만¹⁾ · 이승환¹⁾

서울 성북구 동선동 3가 249-1, 성신여대 생물학과

¹⁾경기도 수원시 권선구 서둔동 농업과학기술원 작물보호부 농업해충과

한국산 애방아벌레속의 분류학적 연구를 수행한 결과 2신종, *Fleutiauxellus grandiniger* sp. nov., *F. parvus* sp. nov. 과 1 신아종, *F. curatus coreaensis* subsp. nov., 및 1 미기록종, *F. yotshuboshi* (Kishii, 1976) 이 확인되었기에 이를 보고한다. 한편, 기기록종, *F. quadrillum* (Candèze, 1873)은 표본을 확인하지 못하였으나 분포 가능성을 배제할 수 없어 목록에 추가하였다.

검색어 : 딱정벌레목, 방아벌레과, 애방아벌레아과, 애방아벌레속, 분류, 한국

(Received: September 9, 2000)

(Accepted: November 20, 2000)